

## Piping Connector

In developing its Component Test Facility (CTF), where NASA tests rocket engine components, Stennis Space Center (SSC) encountered a problem. In the design phase of the CTF's development, it was originally planned to use conventional clamped connectors on the CTF piping lines that carry rocket propellants and other gases.

But Marshall Space Flight Center, which has broad experience with similar connectors, advised that clamped connectors were not suitable for use on lines that carry high pressure cryogenic (extremely low temperature) fuels: the connectors had been known to leak when the propellant lines were chilled to a pretest temperature of 400 degrees below zero Fahrenheit.

SSC decided to develop a new connector and selected Reflange® Inc., Houston, Texas to handle the job. Reflange adapted one of its existing designs to include a secondary face seal more tolerant of severe temperature changes. After testing and refinement, the company produced a connector that solved the problem. Known as the T-Con®, it was used in all CTF locations where severe thermal shock was anticipated.

That task for NASA led to not one, but two, Reflange spinoff products, one of them a commercial T-Con with the secondary seal for thermal shock applications in industrial operations. The second spinoff emerged in the course of T-Con development, when designers realized that, because of the limited need for a large, specialized clamp set in exotic materials, the cost was high.

Reflange looked for other options and came up with the E-Con® dual seal flange design. The E-Con (**above**) offers all the technical advantages of the T-Con but at a reduced cost in larger sizes where quantities required are small. The E-Con features pressure and temperature ratings identical to those of the ANSI standard for comparable flanges, but in higher pressure classes the E-Con offers a smaller more compact design with weight savings up to 79 per cent. The E-Con has been added to the Reflange commercial line.

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